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THE

MOSAIC COSMOGONY

NOT "ADVERSE TO MODERN SCIENCE:"

BEING

AN EXAMINATION OF

THE ESSAY OF C. W. GOODWIN, M.A.,

WITH SOME

REMARKS ON THE ESSAY OF PROFESSOR POWELL,

AS PUBLISHED IN

"ESSAYS AND REVIEWS."

BY J. R. YOUNG,

FORMERLY PROFESSOR OF MATHEMATICS IN BELFAST COLLEGE.

THE SECOND EDITION, ENLARGED.

LONDON:

WM. H. ALLEN AND CO., 7, LEADENHALL STREET.

1861.

Price One Shilling.

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1861, oct. 17.

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PREFATORY NOTICE.

THE writer of the following pages has never yet seen any one of the so-called "Replies" to the "Essays and Reviews." The only examination of the doctrines put forth in that remarkable publication which he has read, is that in the last number (No. 217) of the *Quarterly Review*. The author of the article on the "Essays" is there mainly occupied with matters concerning philology, biblical criticism, and ecclesiastical ordinances and canons: the portions of the book which it is proposed to consider in the present tract are but very cursorily touched upon in that article: these portions present a scientific aspect:—they enunciate statements said to be warranted by the well-established conclusions of modern science,—and to modern science the authors appeal in support and confirmation of the deliverances they utter.

Whether or not any one has yet shown that this appeal has been unadvisedly made, the present writer is unable to say. Instead of perusing the thoughts of others, he has ventured rather—he hopes with no unpardonable arrogance—to put his own upon paper; and he now submits them to the impartial judgment and criticism of unbiassed inquirers after truth;

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believing and hoping that the arguments which have appeared satisfactory to his own mind, may, in some degree, contribute towards removing the doubts and scruples with which certain passages in the "Essays and Reviews" may have disturbed the minds of others.

It may here, too, be right to mention, that although, in speaking of miracles, he has adopted the terms employed by the sceptical writers themselves, yet that a miracle does not necessarily imply either a violation, or an interruption, or a suspension of any of the laws of nature. It is simply an occurrence inexplicable by those laws *alone*, as stated in the first of the lectures referred to at p. 38, and which was originally published in the year 1833. For example,—If we were to see a heavy body suspended in the air near the surface of the earth, without any discoverable support, we should not for a moment suppose that the law of gravity was being violated, or interrupted, or suspended, but should reasonably conclude that some inexplicable power—inexplicable because supernatural—was in operation upon that particular body, and acting in a direction opposite to that of the still existing force of gravity.—See Trench, "Notes on the Miracles," pp. 14–18.

*** In this Second Edition, two or three short sentences have been introduced, and about three pages and a half added to the Remarks on the Mosaic Cosmogony: in other respects, the pamphlet is a reprint of the First Edition. As so many publications, having the same object as the present Tract, have been issued, as well since as before the appearance of this, it may be as well to state that what is here printed—with the above-mentioned exceptions—was in the hands of the publisher on the 19th of March, and that several copies of it were in circulation on the 20th.

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THE MOSAIC COSMOGONY.

In the opening statement of the first chapter of Genesis, Moses does not enter into any details as to the creation, or original occupancy of the earth: he simply makes the brief announcement that "In the beginning," (however remote that may have been,) "God created the heaven and the earth." And here at the outset, it is necessary to ascertain what the writer means by the term "heaven."

Since "modern science" has been appealed to to subvert the Mosaic doctrine, we cannot be precluded from referring to modern science to support it:—What, in the present day, is the scientific meaning of the term "heaven"? to what do we refer when we speak of "the blue heavens"—of "the starry heavens"—of "the heavenly bodies," &c.:—to what but to the luminous expanse above and around us? Not to empty space, but to that *something* which modern philosophers call the *luminiferous ether*, the existence of which—the hypothetical existence at least—they have been driven to assume in order fully to account for the phenomena of *Light*. The earlier notion, that the light of day was produced simply by the emission of luminous particles from

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the sun, was long perceived to involve much perplexity; this was increased when Roemer discovered that these particles must move with the inconceivable velocity of 200,000 miles in a second of time: how could particles of matter, however attenuated, strike the eye with such a velocity without injuring that delicate organ? how was this continuous loss of substance in the sun repaired? how could it be that a body attracting all the planets that circulate round it, and even exercising the same attracting force to bind together the component parts of its own mass—how could such a body at the same time *repel* particles of that mass with such enormous velocity from its surface? But, besides these difficulties and contradictions, the emission theory was found inadequate to account for the observed phenomena of light, several of which were proved to be quite irreconcileable with that theory; and thus, from the very necessities of the case, philosophers were at length compelled to abandon it. They were obliged to assume the existence of an ethereal medium, as a vehicle of light,—greatly more subtil than, but analogous to, the air we breathe, regarded as the vehicle of *sound*. Like as the pulsations of the air, occasioned by a sonorous body, produce sound, so would the pulsations of this ethereal fluid produce light; and the most cautious and eminent investigators have found within the last half-century that not only do phenomena of light, hitherto inexplicable, become satisfactorily explained upon this hypothesis of an undulating ethereal medium, but also that pheno-

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mena predicted in accordance with this hypothesis, become verified by experiment. This has been abundantly proved by Malus, Fresnel, Poisson, Herschel, Airy, Hamilton, Lloyd, Stokes, Powell, and other distinguished men of science of the present century. Herschel says, "It is a theory, which, if not founded in nature, is certainly one of the happiest fictions that the genius of man has yet invented. It is, in fact, in all its applications and details, one succession of *felicities;* inasmuch as that we may almost be induced to say, if it be not true, it deserves to be."

Is, then, the declaration that—In the beginning God created this "heaven," or ethereal substance, "adverse to modern science"? If not, what could it have been created *for?* Surely for the purposes of *light*, which purposes, however,—according to modern science—could be accomplished only by giving the necessary motion to its particles. Will any one say that the Creator could not impress upon it this motion as readily as He could call it into existence?

Moreover, geologists declare, that seeing animals existed during the præ-Adamite period, the period to which this first verse refers, and Mr. Goodwin urgently presses this declaration on the notice of his readers: we concede the fact; which is conclusive as to the existence of light during a portion, at least, of that period. "Physical Science," says the Essayist, "goes on unconcernedly pursuing its own paths. Theology, the science whose object is the dealing of God with man as a moral being, maintains but a shivering existence, shouldered and jostled by the sturdy

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growths of modern thought, and bemoaning itself for the hostility which it encounters." What Mr. Goodwin himself may have done to expedite this onward march of physical science, about which he talks so much, we have no means of knowing: but we think that his acquaintance with what others have done in physical science, at least in physical optics, cannot be very extensive, or he would scarcely say, "light, and the measurement of time, are represented as existing before the manifestation of the sun, and this idea, *although repugnant to* our *modern knowledge*, has not in former times appeared absurd." This word OUR must not include the distinguished men whose names have been mentioned above: the existence of the luminiferous ether before the manifestation of the sun, would not be repugnant to Sir John Herschel's knowledge, as the preceding quotation sufficiently shows: if that remarkable man were asked whether this ether or the sun existed first, or whether they both came into existence together, his answer would doubtless be, that "physical science" tells him nothing about it: *he* would assuredly not discover the absurdity which Mr. Goodwin sees at a glance, whichever of the hypotheses be assumed.

After the brief announcement of the creation of heaven and earth by God, Moses proceeds in the second verse to describe the condition of the latter body at the time when a great and important change was about to be effected upon it, and when another manifestation of creative power was about to take place: he says "the earth was without form and

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void." We thus learn—what science can neither teach nor contradict—that there was a period when the globe we inhabit was a shapeless mass, and when whatever organisms had previously occupied it had become extinct—it was "void." As all life, animal and vegetable, had disappeared from its surface, is it reasonable to suppose that *light* would, notwithstanding, continue to have been supplied? From the presence of seeing animals, geologists, as already noticed, reasonably infer the simultaneous existence of light, but they would surely admit that, when all animal and vegetable life had become extinct, light would have been superfluous; and as we have no ground for assuming that even Omnipotent power throws any of that power away, we feel prepared to expect that the extinction of light would follow the extinction of life; in other words, that the ethereal undulations would cease, and the ether itself, be—not annihilated—but reduced to quiescence. Moses accordingly adds—"and darkness was upon the face of the deep." The remaining words of this second verse are—"And the Spirit of God moved upon the face of the waters." On this we are forbidden to speculate; but, whatever the mysterious operation implied in these words was, it is reasonable to conclude—since Moses tells us that the earth was previously "without form,"—that its present rounded shape was then given to it, and that rotatory motion was also communicated: it is a known mechanical principle, that whatever single impulse produces rotatory motion in a free body, the same impulse gives to the body progressive motion

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also, that the progressive motion must be in a straight line, and that this onward path it would continue to describe so long as no new influence operated on the body. In reference to the words just quoted, "And the Spirit of God *moved* upon the face of the waters," we think it deserving of special attention that these are the only words throughout the entire description, which imply a *moving influence*. Surely this, like every one of the subsequently recorded acts, must have been followed by a *result;* but no result except motion, can reasonably be imagined; and in describing the operation by which the earth was first rolled forward in space, no merely human language could well be more significant and expressive than that which Moses has employed.*

"And God said, Let there be light"—that is, let the already existent but dormant ether resume its function—"and there was light." And here it is worthy of notice that the inspired writer does not say—and God *made* light—the material was already there; the command was simply that it should perform the office for which it was created, that the suspended undulations should become again active: it was not *matter* that was here spoken into existence, but *motion*. We have no right to assume that there was more of this motion—more of this light—than sufficed for the earth's need. "In the beginning,"

* The motion of the *ether*, adverted to at p. 5, is merely a motion of vibration or pulsation, not of progression: there is no transportation of material at all.

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the *whole* of the ether, enveloping the motionless and shapeless mass, might have been created in a state of activity: there might *then* have been no night: now, however, "God divided the light from the darkness," calling "the light Day, and the darkness Night." "And," in consequence of the rotation impressed upon the globe, into which that mass had now been converted, the first change that the enlightened portion underwent was a change from light to darkness, and thus "the evening and the morning were the first day."

It will not fail to be noticed that this division of the light from the darkness, as *a distinct act* of power, was absolutely necessary in the absence of the sun. Had *this* exciting cause of light been then introduced, the division of light and darkness would have at once taken place, and could not have been correctly described as a distinct operation. But (as observed at p. 11) no sooner are the sun, moon, and stars introduced, than this special act of power is withdrawn, and the office of dividing the light from the darkness assigned to those luminaries. The moon and the stars as much divide the comparatively feeble light they give from total darkness as the sun divides the light of day from the darkness of the antipodes.

In the sixth verse "God said, Let there be a firmament;" and in the seventh it is declared that "God *made* the firmament, and divided the waters which were under the firmament from the waters which were above the firmament." Here is another dis-

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tinct act of creation: what the firmament was, we are told in the eighth verse: "And God called the firmament Heaven:" there was thus introduced an extension of the original "heaven:" the remote expanse—the destined regions of the sun, moon, and stars — was furnished for the reception of those bodies—supplied with the material on which they were to act. These *ethereal* regions, extending as far, at least, as the remotest of the contemplated stars, constituted "the firmament," which, we are told, "divided the waters which were under it from the waters which were above it." As science has no access to what may be *above* the firmament, no man is in a condition to say that aqueous matter may not be there as well as below the firmament.

The rotation of the earth, as well as its rectilinear progressive motion, still continuing, "the evening and the morning were the second day." Then follows the separation of the waters from the land, and that vegetable supply that was necessary to prepare the land for the occupation and sustenance of MAN: "And the evening and the morning were the third day." Up to this period it appears, then, that the earth had performed three diurnal rotations, and had all this time been advancing with a uniform motion in a rectilinear direction—describing a straight line: but the Creator now sees fit to check this onward motion, and to compel the earth henceforth to describe an orbit by the attractive agency of the sun: for He said, "Let there be lights in the firmament," &c. "And God made two great lights: the greater

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light" (as a *light*) "to rule the day, and the lesser light to rule the night: He made the stars also. And God set them in the firmament of the heaven," (in that region of the ethereal fluid prepared for them,) "to give light upon the earth. And to rule over the day and over the night, and to divide the light from the darkness," which division of the light from the darkness had, till then, been accomplished without their intervention. "And the evening and the morning were the fourth day." This fourth day then, according to the Mosaic account, was the first day in which the agency of the sun was introduced to perform the offices which it performs now: the material of Light, be it remembered, is the subject-matter: the sun, the physical agent which operates upon it: there is a like distinction between the two as between the tools and the workman who uses them.

Thus explaining the Mosaic narrative by the aid of such light as modern science supplies, and supporting it by no other physical hypotheses than science declares to be necessary for *its* support, we would ask—How can Mr. Goodwin venture to affirm of "the opening Chapter of Genesis" that, "taking its words in their plain sense, it manifestly gives a view of the universe adverse to that of modern science:" that "It represents the sky as *a watery vault* in which the sun, moon, and stars are set," and, again, (where, by the bye, Mr. Goodwin contradicts not only Moses, but himself,) "the sky, firma-

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ment, or heaven to be a permanent *solid vault*"? (See pp. 209, 220.)

One would certainly expect, that any man who should take upon himself the great and onerous task of proving by the aid of modern science that the "Hebrew Descartes" had penned nonsense, would at least have previously acquainted himself with what modern science really was, and would take pains to know what it was *not*. Mr. Goodwin, however triumphantly says—"No quibbling . . . can affect the explicit description of the Mosaic writer contained in the words 'the waters that are above the firmament,' or avail to show that he was aware that the sky is but transparent space"! Mr. Goodwin *is*, then, "aware" that the sky is but *transparent space*." Will he mention the name of any other modern philosopher whatever, who is equally "aware" of this? We venture to say, that there is not a modern philosopher in the whole world who would not reject Mr. Goodwin's dictum.

Let us see what certain "modern philosophers," of no mean reputation, though *unaware* of this "transparent space" do say. Professor Encke, with all the modesty which forms part of the character of a great man, thus expresses himself:—"If I may be permitted to express my opinion on a subject which for twelve years has incessantly occupied me, and in treating which I have avoided no method, however circuitous, no kind of verification, in order to reach the truth as near as lay in my power, I cannot con-

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sider it otherwise than completely established, that an extraordinary correction is necessary for Pons' comet; and equally certain is it, that the principal part of it consists in an increase of the mean motion proportionate to the time. Another question, which is properly more physical than astronomical, is this, whether the hypothesis of a *resisting medium* gives the true or probable explanation, though *hitherto no other appears to me to have equal weight.*" (Airy's translation of Encke's Dissertation on the Comet, 1832.) The Astronomer Royal (Airy) himself remarks:—"Encke has stated that his hypothesis, which represents all the later observations within a few seconds, does also represent the earlier observations within about eight minutes, and a part of this he thinks due to the inaccurate calculations of perturbation. Consequently, *the supposition of no resistance must be enormously in error, for some of the appearances; and there can, therefore, scarcely be a doubt that the hypothesis of a resisting medium, or something which produces almost exactly the same effects, is the true one.*" We need scarcely add, that this "resisting medium" is regarded by the most eminent cultivators of "modern science" as identical with the luminiferous ether.

The Essayist, in referring to the statement that the heavenly bodies were "*set* in the firmament," prints the word *set* in italics, evidently regarding it as a term confirmatory of his theory—"That the Hebrews understood the sky, firmament, or heaven, to be a permanent solid vault, as it appears to the ordinary

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observer." If the words had been "set *upon*" the firmament, &c., instead of "set *in*," there might have been some little show of plausibility about this theory; but even then, "modern science" would have supported and justified the phraseology, though that theory be false. The late Sir William Herschel, in detailing his observations on Nebulæ, uses this language:—"One of these nebulous beds is so rich, that, in passing through a section of it, in the time of only thirty-six minutes, I detected no less than thirty-one nebulæ, all distinctly visible *upon a fine blue sky*."

We think that we may now safely leave the unbiassed reader to judge for himself; and, forming his own conclusions as to the reasonableness or the absurdity of the "Mosaic narrative"—giving to the words of that narrative "their genuine and natural meaning,"—may ask whether he is or is not forced to agree with Mr. Goodwin in the assertion "That this meaning is *primâ facie* one wholly adverse to the present astronomical and geological views of the universe is evident enough. There is not a mere difference through deficiency. It cannot be correctly said that the Mosaic writer simply leaves out details which modern science supplies, and that therefore, the inconsistency is not a real but only an apparent one. It is manifest that the whole account is given from a different point of view from that which we now unavoidably take; that the order of things as we now know them to be, is to a great extent reversed, although here and there we may pick out

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some general analogies and points of resemblance" (p. 223).

As an instance, "that the order of things as we now know them to be is to a great extent reversed," take the following: "As for the glittering dust which emblazons the nocturnal sky, there is *reason to believe* that each spark is a self-luminous body," [Reason to believe! It is known to be so.] "*perhaps* of similar material to our sun, and that the very nearest of the whole tribe is at an incalculable distance from us, *the very least of them of enormous size compared with our own humble globe.* Thus has modern science reversed nearly all the *primâ facie* views, to which our senses lead us as to the constitution of the universe."

Similar quotations as to what Mr. Goodwin tells us "there is reason to believe," and as to what may "perhaps" exist, might be given in abundance from his Essay: "if" and "perhaps" are repeatedly employed to usher in the most fanciful and baseless visions; and then "modern science" is unjustly charged with endorsing them. What "modern science" is it that authorizes Mr. Goodwin to say that "the very least of the fixed stars is of enormous size compared with our own humble globe"? Assuredly not *astronomy*—Is it mesmerism?

Astronomy declares absolutely *nothing* about "the enormous size," of the fixed stars, but it the rather confesses that it has never been able to discover any size in them at all. The most powerful telescope has never detected any solid nucleus, or core, in a fixed

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star; it ever has the appearance—as well to the astronomer as to the casual observer—of merely a mass of *light;* and it is in reference to the apparent amount of this light alone that astronomers speak of the different relative *magnitudes* of the fixed stars.* Algol, in the Head of Medusa, passes through continuous changes from a star of the second magnitude to one of the fourth, and then increases again to the second magnitude, all within a less space of time than three days. "Our own humble globe," as Mr. Goodwin calls it, may not be quite such an "insignificant" body as he *supposes.* For aught that "science" teaches to the contrary, it may exceed in mass the aggregate quantity of matter in all the fixed stars in the universe; if such be not the actual case, let Mr. Goodwin prove it, and not content himself with merely asserting it: if *he* "will not believe Moses and the Prophets," neither will we believe *him.*

No man ever investigated the starry heavens with more unremitting industry, nor ever brought more sagacity to the task, than the elder Herschel; yet even his most powerful telescopes, used with a keenness of observation that has never been surpassed, never revealed to him anything more respecting the constitution of the stars than is revealed to

* "As to the actual magnitude and distance of the stars, we may be said to be almost unacquainted with either: all that we are able to state with certainty is, that their distance is immense—the nearest star must be distant from us more than *twenty billions of miles.* How much their distance may exceed this, it is impossible for us to say; and much less are we able to offer even the most distant conjecture as to their actual magnitude."—Art. "Astronomy," by Prof. Barlow, in the Encyclopædia Metropolitana, p. 508.

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the unassisted eye of the ordinary spectator: all that he ever saw was light; light, inconceivably brilliant, it is true, but he never detected the least indication of a solid nucleus. Speaking of one of his examinations of some of the fainter stars, through his forty-feet telescope, he says:—"The appearance of Sirius announced itself at a great distance, like the dawn of the morning, and came on by degrees, increasing in brightness, till this brilliant star at last entered the field of view of the telescope, with all the splendour of the rising sun, and forced me to take the eye from that beautiful sight." Light, and light only, was, however, all that the observer saw.

As it would be wearisome to enumerate *all* Mr. Goodwin's assumptions—implied and expressed—in *his* Cosmogony, we will merely notice in addition one or two more.

"This earth, apparently so still and steadfast, lying in majestic repose beneath the æthereal vault, is a globular body of comparatively insignificant size" (p. 212). Was it *always* "a globular body"?

"Here geology steps in and successfully carries back the history of the earth's crust to a very remote period" (p. 213). Was the *present* always the earth's *crust?*

"But the first clear view which we obtain of the early condition of the earth, presents to us a ball of matter" (p. 213). What was it *before* this "early condition"?

"They" (the heavenly bodies) "had, as we well know, marked out seasons, days, and years, and had

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given light for ages before to the earth, and to the animals which preceded man as its inhabitants" (p. 228). Who are the *we* that *well know* all this?

"Our earth then is but one of the lesser pendants of a body" (the sun) "which is itself *only an inconsiderable unit* in the vast creation" (p. 213). How does *Mr. Goodwin* know this? Not assuredly by science: Does he claim the inspiration he denies to Moses—the "early Copernicus"?

It would be easy to adduce plenty of other instances of rash and unsupported, and therefore unscientific assertions from the Essay of this singular writer; but it would be superfluous to quote them. We shall merely add that having, as he thinks, shown Moses' narrative of the early condition and subsequent state of the earth to be false, he proceeds to give us its true geological history, and introduces us to stratum after stratum, system after system, creation after creation, from the most insignificant organizations "until we come to man, as the crowning point of all." The Almighty, it seems, at first "tried his 'prentice hand"* on the molluscs, and a few ferns; then, after ages of contemplative retirement, He came forth qualified for a higher effort, and "the race of fishes, the lowest creatures of the vertebrate type," were produced; and so on, age after age. And thus continuing to improve, during each long intervening period of rest, He at last reached "the crowning point of all," and made man!

To us, this looks very like eliminating omnipotence

* This quotation is from the poet Burns, and not from Mr. Goodwin.

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from the Deity, and all but humanizing GOD. As the writer makes Moses to be "a Hebrew Descartes," or an "early Copernicus," so he appears to degrade the Deity to a modern Dalton, or a modern Watt, whose scientific progress from the first miserable beginnings, we trace step by step, improvement upon improvement, till, after years of patient and laborious study and investigation, they achieve the Atomic Theory, or the Steam Engine:—the "crowning point of all." We cannot for a moment think that the writer intends to do this; but he certainly lays himself open to the appalling suspicion.

If we only grant the geologists of Mr. Goodwin's school plenty of time for the work—a few millions of centuries, and an unlimited command of the agencies of "Nature," to be brought into operation when they please, and how they please, they will no doubt construct a world; and will detail the process by which it has been completed: yet the wisest of them would be puzzled to explain the formation of an orange.*

But receiving the inspired declaration of Moses, that the present rotating globe was once "without form," and admitting that this præ-Adamite shapeless mass abounded in luxuriant vegetation: that living creatures then roamed about its surface, and inhabited its waters,—where, we would ask, now that for six thousand years this once shapeless body has preserved the form into which it was then moulded—

* The reader is earnestly recommended to consult a masterly paper on "Illogical Geology," in No. 5 (July, 1859), of "The Universal Review of Politics, Literature, and Social Science," published by W. H. Allen and Co., Leadenhall Street.

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where, but at depths more or less considerable below the surface of its *present spherical* crust, ought we to expect that the remains of these præ-Adamite existences would be found?

'In the primitive condition of the earth—over which light and warmth were uniformly diffused, variations of temperature must have depended mainly upon distance from that internal heat which the artesian springs and the Iceland geysers show to exist now. The lower organisms would thus occupy those deep recesses of the shapeless mass where the dank warmth was best suited to their exigencies. Habitable portions of its surface might have had temperatures of which *now* we have no examples, any more than we have examples of that teeming life, animal and vegetable—of those gigantic reptiles and huge pines—which such fertile and stimulating regions must have been fitted to nurture.

To speak of *geographical* position, in reference to any spot on the præ-Adamite earth, would be to use language which would convey no meaning—*latitude* would be an unintelligible term: the distinction between polar and torrid regions could not have existed, for there was no *sun;* and so far from the *absence* of this body during the præ-Adamite ages creating a geological difficulty, the difficulty is to account for uniformity of external temperature on the hypothesis of its *presence.* If the distribution of temperature were as now, how could the same luxuriant vegetation have flourished equally on what is now the icy coast of Melville Island, and on the

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arid plains of Australia—as Hugh Miller, quoted by Mr. Goodwin, affirms?

And "why should it be thought a thing incredible" that God should produce Light, except by means of the sun: when it is admitted that He produced the sun itself without any means at all? Is not this to "strain at a gnat and swallow a camel"? *

In terminating these remarks the author must request the reader to bear in mind the single purpose for which they were penned: the purpose, namely, of showing that the "Mosaic Cosmogony" is not so "adverse to modern science" as Mr. Goodwin affirms it to be—and nothing more. The laws which it has pleased the Almighty to impress upon the matter He has created, we may allowably investigate, and trace to their legitimate consequences: but *how* He created this matter, or *when* He impressed upon it those laws, are questions which science cannot answer; much less can it presume to say that these same laws must have governed Omnipotence in originating the scheme, or in elaborating the details of the Universe.

To expect that *science* can unravel everything in the works, and in the revealed word, of the Almighty, is as presumptuous as it is absurd. Talk about the onward march of physical science as we may, we well know that this march is not always a movement of progression; science is often compelled to retrace its steps, to obliterate from the chart of

* Who has not witnessed the brilliant illumination of the whole surrounding horizon by a flash of lightning—and that, too, at *midnight*? Where was the sun then?

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Nature, in one age, much that it had mapped down in the preceding; and to take a new departure from a previously-attained stage of its course. And, succeed as we may, we must always ultimately reach a point at which human intellect is brought to a stand, and at which it is compelled to acknowledge its own infirmity and helplessness.

No one is likely to accuse the late Dr. Birkbeck of religious fanaticism; in speaking of the phenomenon of vision he thus expresses himself:—"The picture on the retina is the ultimate physical circumstance which physiologists have yet traced when vision occurs, and between that and actual sensation and perception, all is darkness. We *know* that there are impressions on the retina; we *know* that in ordinary cases, when these are received, vision follows; but we *know not* how the bodily impression is connected with the mental perception; and, to account for it by further impressions on the optic nerve, by impressions on the brain, and by this being the seat of intelligence, only serves to keep our ignorance out of view, and attempts to explain the incomprehensible connection between the impression on the retina, and the sensation of sight, by another equally incomprehensible connection, viz. an impression on the brain with this sensation, of which connection, however, we have no knowledge whatever.

"There is indeed in this, as in every other physical inquiry, a barrier, beyond which it is forbidden to human intellect to advance. There are, in every direction, some bounds to our knowledge, which,

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although they continually recede as investigation advances, can never be passed,—which equally exist, though their extent is different, for the most ignorant savage, and the most enlightened philosopher; and at which every man, finding himself suddenly arrested, and unable to explain the connection between certain phenomena, feels the sentiment of wonder, and is compelled to reverence a Power, the ways of which he is thus made sensible are inscrutable by a finite mind!"*

But for these shortcomings of science, there would be little or no room for the sentiment here adverted to. If everything in the Works and in the revealed Word of Deity were fully explicable by the human intellect, we could hardly render Him that intellectual homage and submission which He so justly demands, and which, as it is, we are so imperatively constrained to yield. Indeed, as respects his WORD, if the case were otherwise, it would be a misnomer to call it a *Revelation;* we might, with like propriety, call geometry a revelation. No one ever thinks of giving homage to Euclid; we never believe *him;* we receive as true just what he demonstrably proves to be true, and nothing more. Irresistible conviction must always effectually exclude faith; and such conviction is not to be had, even in the physical sciences themselves. All our individual knowledge, derived from these sciences, rests, more or less, upon a mixed basis of personal observation, reason, and faith—faith in the testimony, and in the recorded observations of others. Natural philosophers feel justified in speak-

* Birkbeck's translation of Dupin's "Geometry applied to the Arts."

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ing with confidence of the magnitude of the earth, of the force of its gravity, of the depths of its seas, and of the heights of its mountains. But not one of them in a thousand, has ever for himself measured an arc of the meridian, or the space descended by a heavy body in a second of time:—has ever sounded the Atlantic Ocean, or determined the altitude of Mont Blanc.

That genuine science will ever prove adverse to Revelation, there is no *fear;* that it will ever penetrate its mysteries, there is no *hope;* for these are the deep and inscrutable problems of Him, "in whom are *hid* all the treasures of wisdom and knowledge." (Coloss., Chap. ii. v. 3.)

NOTE.—Hebrew scholars contend, and no doubt correctly, for a distinction of meaning between the original words for "created," and "made;" the former implying bringing into existence, and the latter, appointing, or preparing for an especial office. But the author submits that the creating and the appointing always occur in immediate succession; that is, without any considerable lapse of time. And further, that the command, "Let there be," implies the calling forth of what, immediately before the issuing of that command, was not—whether it be matter or motion.

He would also remind the reader here that "the heaven" in the first verse of Genesis, is regarded in the foregoing pages as what may be called the *terrestrial* heaven; the firmament, in verses 6, 7, being the *sidereal* heaven. *This*, even in the densely-crowded Milky Way, Lord Rosse's great telescope has penetrated, reached its confines, and has discovered *beyond* "a perfectly black ground." (*See* Sir John Herschel's "Outlines of Astronomy.") Is it not possible that above this "black ground," this dark and starless stratum, there may be another, and *totally distinct* region of light, a *third Heaven?* And the author would ask, putting the inquiry with great diffidence, May not a literal meaning be given to the remarkable declaration of St. Paul: "I knew a man . . . caught up in the *third heaven*"?

[Since the first edition of this Tract was printed, the author has seen several other publications having the same object, but all treating the matter in a different way. Should this difference of explanation be commented upon in the spirit in which Mr. Goodwin utters the exclamation that "theological geologists overthrow one another's theories," may it not be asked,—If Scripture and science can be reconciled in more ways than one, what becomes of the infidel objection *that they cannot be reconciled at all?*]

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REMARKS ON

PROFESSOR POWELL'S ESSAY.

It is stated in the prefatory notice, to which the attention of the reader is directed—on the first page of the "Essays and Reviews," that the authors "have written in entire independence of each other, and without concert or comparison." The Essays of Mr. Goodwin and Professor Powell furnish internal evidence—that, so far at least as those gentlemen are concerned,—this must have been the case. Of all the writers, Professor Powell was the only man distinguished for high attainments in mathematical and physical science. In a judicious allotment of subjects, the topics undertaken by Mr. Goodwin would unquestionably have been assigned to Mr. Powell—if there had been "concert;" and the finished performance of the former writer would never have been suffered to appear, without considerable modification by the latter—if there had been "comparison." If the few introductory words of explanation "To the Reader" had been omitted, the general impression would, of course, have been that the several papers were the result of preconcerted arrangement as to

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topics and writers; and that, in its completed state, each performance had been submitted to the critical scrutiny, and had received the united commendation of the other members of the literary firm.

Such an impression would have been specially damaging to Professor Powell's character, for at least scientific honesty, if not for moral honesty; for every one acquainted with that gentleman's scientific reputation, would know that he could not conscientiously endorse Mr. Goodwin's astronomical theories; and he would thus have exposed himself to the grave charge of being ready to countenance what he knew to be scientific error, provided only it tended to subvert inspired truth.

But abandoning to another subjects of physical inquiry which he himself was so well able to discuss, and which he must of necessity have handled in a very different way, Professor Powell chooses for his theme the credibility of human testimony, and the miracles of his Saviour; and condescends to reproduce, under his own distinguished name, the string of now exploded fallacies with which David Hume startled the Christian world a century ago.

But although the argument—if argument it can be called—is substantially Hume's, Mr. Powell certainly puts the concealed assumptions, originally involved in it, in a more undisguised and out-spoken form. He says:—"The enlarged critical and inductive study of the natural world cannot but tend powerfully to evince the inconceivableness of imagined interruptions of natural order, or supposed suspensions of the

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laws of matter, and of that vast series of dependent causation which constitutes the legitimate field for the investigation of science, whose constancy is the sole warrant for its generalizations, while it forms the substantial basis for the grand conclusions of natural theology. Such would be the grounds on which our convictions would be regulated as *to marvellous events at the present day;* such the rules which we should apply to the *like cases narrated in ordinary history*" (p. 110).

This involves nothing more nor less than an authoritative hypothesis; unsupported by any reasoning whatever, namely, the *inconceivableness* of *imagined* [sic] interruptions of natural order, or supposed suspensions of the laws of matter." The "inconceivableness" implies the impossibility: the writer adds:—"But though perhaps the more general admission at the present day of critical principles in the study of history, as well as the extension of physical knowledge, has done something to diffuse among the better-informed class more enlightened notions on this subject, taken abstractedly, yet they may still be much at a loss to apply such principles in all cases: and readily conceive that there are possible instances in which *large exceptions must be made.*" [The italics are the Essay-writer's own.]

Now in a work that undertakes to show that a miracle could never be wrought, although we should be quite prepared for the absence of all sound reasoning, yet we are entitled to expect at least consistency in the authoritative statements put forth. In this

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passage, however, the author admits that there may be "among the better-informed class," those who "readily conceive," what in the former paragraph he declares to be "inconceivable." But merely to point out this contradiction is not the object of the latter quotation, but to show that the author affirms interruptions of natural order, or suspensions of the laws of matter to be *impossible*. Why did he not content himself with this postulate, and thus limit his Essay to a single page? *This* admitted—and he calls upon us to admit it—settles the dispute: the argument—so to mis-name it—commences and terminates at a single step: the beginning is the end. Miracles being, by hypothesis, impossible, what reasoning is necessary—or even applicable—to show that any specified miracle could never have been wrought? It would have been more discreet, at all events more dexterous in Professor Powell, if he had narrowed the range of his postulate:—if he had started with the hypothesis that interruptions of natural order or suspensions of the laws of matter, were *not* impossible; and had then proceeded to show, by an examination into the credibility or incredibility of the testimony of the declared witnesses, and into the authenticity of the writings which recorded it, that the evidence in support of the affirmed "miraculous event," was insufficient to establish its actual occurrence. But what is the use of talking about the fallibility of human testimony, and of "the peculiar capacity and apprehension of the party addressed," in reference to an event that could not possibly have taken place? If the evidence for the Gospel miracles

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or for any other alleged miracles, is ever to be shaken or overturned *by argument*, the principle that miracles are *not* impossible, must first of all be admitted; otherwise there is no room for *argument* at all. But Professor Powell overlooks this obvious truth: he quotes "the dictum of two great authorities of the Scottish school, Drs. Abercrombie and Chalmers, that on a certain amount of testimony we might believe any statement, however improbable;" and then remarks—"so that if a number of respectable witnesses were to concur in asseverating that on a certain occasion they had seen two and two make five, we should be bound to believe them!" What an extraordinary inference! Surely Mr. Powell would never have admitted that the occurrence here testified to was no more than highly "improbable:" was it not absolutely *impossible?* and therefore, as stated above, to talk about *any* evidence proving it to be *possible* "on a certain occasion" is simply absurd. But the author seems to have a very singular notion of the word impossible, and in the statement we are about to quote has himself unwittingly furnished a remarkable instance of a fact which, previously to its actual exhibition, every person competent to form a sound judgment on the matter would have pronounced to be incredible: he says—"No amount of attestation of innumerable and honest witnesses would ever convince any one versed in mathematical and mechanical science, that a person had squared the circle, or discovered perpetual motion" (p. 141). Who would have expected this from the Professor of Geometry at Oxford? All that can be

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safely said respecting the geometrical quadrature of the circle is—that the problem has never yet been solved: for aught that anybody can predict to the contrary, a satisfactory solution may be accomplished to-morrow.

Again: "If the most numerous ship's company were all to asseverate that they had seen a mermaid, would any rational persons, at the present day, believe them?" We would further ask, Would any rational persons, at the present day, be justified in *disbelieving* them? The hypothesis implies that there is no limit to the number of attestors:—would not rational persons, instead of summarily rejecting the evidence, be rather moved to inquire into the reported fact? What impossibility does it involve? And how would the rational persons, at the present day—the rational geologists for instance—know but that another creation was now about to be inaugurated, and that the said mermaid was merely a sample of the "new species"?

But so firmly is Mr. Powell convinced of the "inconceivableness of imagined interruptions of natural order," that he would not believe even the evidence of his own senses to the fact, and affirms that other people ought to be equally incredulous. "Testimony, after all, is but a second-hand assurance; it is but a blind guide; testimony can avail nothing against reason. The essential question of miracles stands quite apart from any considerations of *testimony;* the question would remain the same, if we had the evidence of our own senses to an alleged

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miracle, that is, to an extraordinary or inexplicable fact. It is not the *mere fact*, but the *cause* or *explanation* of it, which is the point at issue" (p. 141).

This, strange as it sounds, is quite in keeping with the writer's original dogma or maxim that any interruption of natural order is absolutely impossible. The idea that there exists an *omnipotent* power is pure fiction. Some power superior to man must, we presume, have brought the material universe into existence, and have originated the "natural order" it exhibits; but that power, whatever it be, *could not* have arranged things otherwise, else it could modify the arrangement now, which, however, is impossible. "The Divine Omnipotence is entirely an inference *from the language of the Bible*, adopted *on the assumption* of a belief in revelation. That 'with God nothing is impossible,' is the very declaration of Scripture; yet on this the whole belief in miracles is built, and thus, with the many, that belief is wholly the *result*, not the *antecedent* of faith" (p. 113). [The italics are the Essayist's.]

It seems to us that such statements as this ought to preclude the Essay on the "Study of the Evidences of Christianity" from having any effect, "dangerous," or otherwise, upon the mind of any sane and thinking person, be he Christian or not. Let it be remembered that nothing whatever in the Essay is *proved*, or even attempted to be proved: all is dogmatical assertion, which, like that just quoted, is in most cases directly opposed to what each person knows for himself to be experienced fact. Can any

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one who looks abroad upon creation—upon the heavens above and the earth beneath, truthfully say that, as far, at least, as his own convictions are affected by the survey, "The Divine Omnipotence is *entirely an inference*,"—not from His works—but from the language of the Bible? Is it *true* that "The philosopher denies the credibility of alleged events professedly in their nature *at variance with all physical analogy*"? Did Locke, and Boyle, and Newton deny the Resurrection of Jesus Christ? Do Herschel, and Brewster, and Babbage, and Robinson, and Lloyd deny it? A contemporary of Professor Powell, a fellow-labourer in the same field of physical research, and one who ranks considerably higher on the roll of scientific names, says, "No doubt, in the sciences which we call physical, the only method that we can employ with success consists in observing facts, and in afterwards submitting the observations to calculation. But it would be a serious mistake to think that we can find certainty only in geometrical demonstrations, or in the testimony of the senses, . . . there exist truths other than the truths of algebra:—realities other than sensible objects." *

But in opposition to these views, which, after all, are only the views of common sense, Professor Powell (at

* "Sans doute, dans les Sciences, qu'on nomme naturelles, la seule méthode qu'on puisse employer avec succès consiste à observer les faits et à soumettre ensuite les observations au calcul. Mais ce serait une erreur grave de penser qu'on ne trouve la certitude que dans les démonstrations géométriques, ou dans le témoignage des sens. . . Soyons donc persuadés qu'il existe des vérités autres que les vérités de l'algèbre, des réalités autres que les objets sensibles."—*Cauchy, Cours d'Analyse*, p. v.

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least in his *Essay*) is determined to know absolutely nothing out of the domain of the mathematical and physical sciences. He unwarrantably brings under their category subjects wholly without their range, and approaches those subjects in precisely the same attitude of mind with which he would sit down to examine a doctrine delivered by Lagrange or Laplace. That "with God nothing is impossible," is a proposition he cannot admit, inasmuch as it is not established by mathematical demonstration. He can conceive things which he himself knows to be possible which, nevertheless, God has not actually done: on what scientific ground, therefore, ought he to admit that He *could* do them? Hume says we have no *proof* that God could make a single blade of grass more than at present exists, and mathematical or physical proof that He could we certainly have not. Why then should Professor Powell admit the *Omnipotence* of God? It is an idea that he cannot for a moment entertain; the proof of it falls short of strict mathematical demonstration, and from the very nature of the case must of necessity fall short of it, even if Omnipotence actually *did* exist. However vast and magnificent the display of power, yet only a finite amount of it could be presented to our senses, or be cognizant to our minds: why then should he be called upon to admit that *more* than that finite amount of power actually exists? Is it not clear that by so doing he would be assenting to an undemonstrated proposition:—would this be philosophical? Do not the exact sciences condemn such gratuitous assent to

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propositions unproved, or to asserted matters of fact unverified? It is true, he does himself build upon a certain physical *axiom*, namely, that "the laws of matter" are unalterable,—that as they are now, so, without any interruption or suspension, they have always been; but this is allowable—all science has its fundamental, undemonstrable, *self-evident* truths, even geometry. "Grant me *that*," he seems to say, "and what becomes of your asserted miracles—of your assumption of an Omnipotent Creator?—Is it not absurd to introduce Omnipotence when there is nothing to be done—how can *any* power alter what is unalterable?"

The above is a perfectly fair summary of Mr. Powell's doctrine. It is just such a syllabus of the Essay as an industrious student would prepare if he had to pass an examination upon it by the Oxford Professor. If it should be read by any person who has not perused the Essay itself, that perusal—except for the graces of composition it exhibits, will be quite unnecessary. And we are willing to admit that if the condensed sketch of what is here stated to be the philosophical and theological views of Professor Powell, as unfolded in his work, be in any respect overcharged or unfairly coloured, we must have erred wilfully. He has delivered his opinions with clearness and precision; and no careful reader of them can mistake what those opinions are—what they assume, what they reject, and what they inculcate.

And now in closing these remarks, the author of

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them cannot but express his deep sorrow that he should have had any occasion to speak of one whose scientific attainments he had always admired—whose moral character he had always respected—and whom he had been privileged to call his friend, in the way he has been here constrained to speak of Professor Powell. Most of his publications are valuable gifts to science: this, *his last*, is a legacy to—what? It exhibits a phenomenon which, fortunately, is not often witnessed:—a species of intellectual suicide. Is it not possible that, so shortly before his departure from this life, his mind—long and laboriously strained by the deep and difficult investigations in which he was continuously engaged — may have become unhinged:—his intellectual vision obscured: and that he was unconscious to himself, in this his final contemplation of the "Evidences of Christianity," that he was "seeing through a glass, darkly"?

NOTE.

The Position of Hume, in his Essay on Miracles, amounts to this, namely: — That no amount of human testimony *for*, can counterbalance the weight attached to the uniform experience of mankind *against* a departure from the course of nature. This position, as it does not go the length of openly assuming a departure from the course of nature to be impossible, can be grappled with, and examined upon mathematical principles. It has been so examined,

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and the two following propositions have been rigorously demonstrated.

1. If thirteen impostors, or thirteen insane or deluded persons affirm, without collusion, that they were eye-witnesses of a miracle—supposing even that only *ten* pretended miracles could be invented or suggested to their minds, the probability that they affirm the truth is *five times* as great as the probability for the constancy of the laws of nature.

2. If thirteen witnesses, whose veracity is such that they each tell *one* falsehood in every *ten* statements they utter, testify, without collusion, to the occurrence of a *specified* miracle, the probability of the truth of their statement is, as before, *five times* the probability for the constancy of nature.

The additional datum for the calculation of the probability in each of these cases is this:—Assuming with Laplace that the origin of the human race was about 6000 years ago, and that thirty years is the average duration of a generation, 200 generations must have passed away: and allowing the average population of the earth to have been a thousand millions, we find that there have lived and died since Adam, about two hundred thousand millions of individuals: the experience of all these in favour of the *non-occurrence* of a miracle is therefore *two hundred thousand millions to one.* Calculation with this datum shows incontrovertibly, that if only thirteen individuals under the above conditions testify to the *occurrence* of a miracle, the probability that the miracle *did* occur is a *million millions to one.*

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"It is the drift of Hume's argument to establish the position, that the occurrence of a miraculous event ought to be believed only by those who were the actual eye-witnesses of it. Now, admitting it to be necessary, although certainly not sufficient, that the bearer of a divine message should authenticate his mission by the working of a miracle, it would follow, in order that all might receive this message, that all should be eye-witnesses of the miracle; and moreover, as traditional evidence, and the experience of others, whether verbal or recorded, goes for nothing, it is further necessary that the miracle be repeated to each succeeding generation, and so on to the end of time. But a phenomenon that thus presents itself to the observation of mankind age after age, with unfailing certainty, is not *a miracle*, but *a law of Nature*; if not, what is it that distinguishes the *law* from the *violation?*

"The partisans of Hume might escape this dilemma, by proposing that the *same miracle* should not be repeated age after age, but that there should be a succession of *different* miracles, or of violations of law in different departments of nature. But these so-called violations of law would be destructive of all law, for no department of nature being uniform in its phenomena, no laws could be recognized, and consequently no miracle.

"It is therefore absolutely essential, in order that miracles may retain their character as such, and produce their intended effect upon our belief, that they be of infrequent occurrence, and be handed down

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from age to age, as the recorded testimony of eye-witnesses. And it is strictly true, that the force of human testimony, in a matter of this kind, comes at length, to exceed that of actual personal experience; since, as just shown, miracles which every successive generation is called upon to witness, either at length fall in with the laws of nature, and thus lose their character and effect, or else they render those laws so obscure and ambiguous, as to leave the breach of them undistinguishable from their performance."*

* From the author's "Three Lectures on Mathematical Study." 1846. Longman and Co.

CRITICAL NOTICES OF THE FIRST EDITION.

"We cordially repeat our recommendation of this unpretending, yet most useful and available, contribution to the Essayist-controversy now pending."—*The Compass*, April 6, 1861.

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"Mr. Young brings a great deal of scientific learning to bear upon Mr. Goodwin's Essay. The latter portion of the pamphlet contains some able remarks on Mr. Powell's Essay on Miracles. It is a pamphlet of considerable interest."—*The Literary Churchman*, May 1, 1861.

"The author shows, with great force, that many points brought forward by Mr. C. W. Goodwin as results ascertained by science, and alleged as antagonistic to the narrative of Genesis, have no such authority and certainty as is ascribed to them . . . . The pamphlet concludes with some acute strictures on Professor Powell's argument, or rather assertion, that miracles are impossible."—*The Guardian*, May 15, 1861.

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